

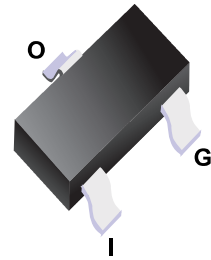
■ Digital Transistor

■ Features

- Epitaxial planar die construction.
- Complementary NPN types available(DTC).
- Built-in biasing resistors, $R_1=R_2$.
- Also available in lead free version.

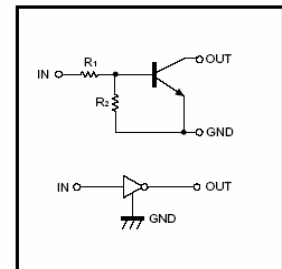
■ Applications

- The NPN style digital transistor.



■ Simplified outline(SOT-523)

● Equivalent circuit



Type No.	Marking	Package Code
DTC114EE	24	SOT-523
DTC124EE	25	SOT-523
DTC143EE	23	SOT-523
DTC144EE	26	SOT-523

■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Symbol	Parameter	Value	Units	
V_{CC}	Supply Voltage	50	V	
V_{IN}	Input Voltage	DTC114EE	-10 to +40	
		DTC124EE	-10 to +40	
		DTC143EE	-10 to +30	
		DTC144EE	-10 to +40	
I_o	Output Current	DTC114EE	50	
		DTC124EE	30	
		DTC143EE	100	
		DTC144EE	30	
$I_C(\text{Max.})$	Output current	ALL	100	mA
P_D	Power Dissipation	150	mW	
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient Air	833	$^\circ\text{C}/\text{W}$	
T_j, T_{stg}	Operating and Storage and Temperature Range	-55 to +150	$^\circ\text{C}$	

■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Input Voltage	$V_{I(off)}$	$V_{CC}=5V, I_O=100\mu A$	0.5	1.1	-	
Input Voltage	$V_{I(on)}$	$V_{CC}=5V, I_O=100\mu A$ $V_O=0.3V, I_O=10mA$ $V_O=0.2V, I_O=5mA$ $V_O=0.3V, I_O=20mA$ $V_O=0.3V, I_O=2mA$	-	1.9	3	V
Output Voltage	$V_{O(on)}$	$I_O/I_I=10mA/0.5mA,$	-	0.1	0.3	V
Input Current	I_I	$V_I=5V$	-	-	0.88 0.36 1.8 0.18	mA
Output Current	$I_{O(off)}$	$V_{CC}=50V, V_I=0V$	-	-	0.5	μA
DC Current Gain	G_I	$V_O=5V, I_O=5mA$ $V_O=5V, I_O=5mA$ $V_O=5V, I_O=10mA$ $V_O=5V, I_O=5mA$	30 56 20 68	-	-	
Input Resistor	$R_1(R_2)$		7 15.4 3.29 32.9	10 22 4.7 47	13 28.6 6.11 61.1	k Ω
Resistance Ratio	R_2/R_1	-	0.8	1	1.2	
Gain-Bandwidth Product	f_T	$V_{CE}=10V, I_E=-5mA,$ $f=100MHz$	-	250	-	MHz

■ Typical Characteristics

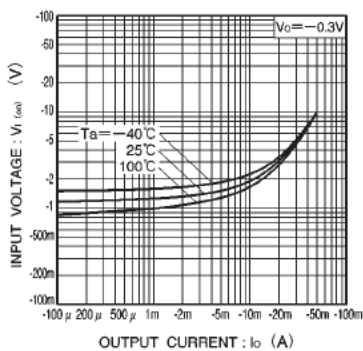


Fig.1 Input voltage vs. output current (ON characteristics)

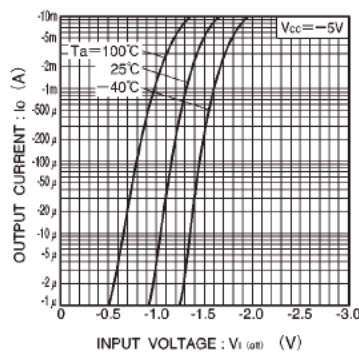


Fig.2 Output current vs. input voltage (OFF characteristics)

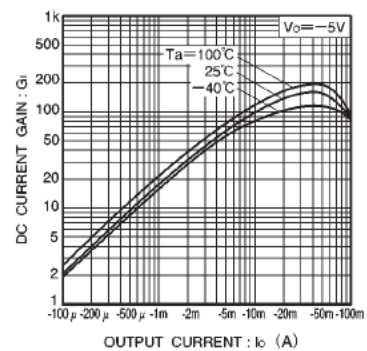
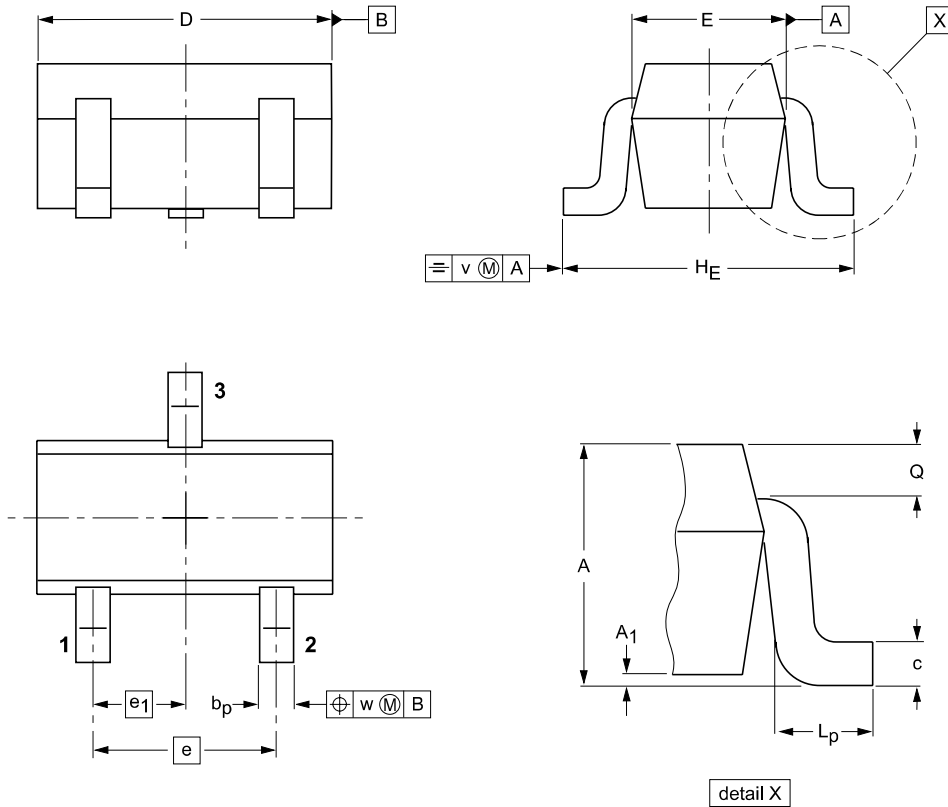


Fig.3 DC current gain vs. output current

Package Outline

SOT-523



DIMENSIONS (mm are the original dimensions)

UNIT	A	A ₁ max	b _p	c	D	E	e	e ₁	H _E	L _p	Q	v	w
mm	0.95 0.60	0.1	0.30 0.15	0.25 0.10	1.8 1.4	0.9 0.7	1	0.5	1.75 1.45	0.45 0.15	0.23 0.13	0.2	0.2

Summary of Packing Options

Package	Packing Description	Packing Quantity	Industry Standard
SOT-523	Tape/Reel, 7" reel	3000	EIA-481-1